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## Disaster Response and Individuals with Disabilities: An Examination of Kentucky's Red Cross Shelters

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# **Disaster Response and Individuals with Disabilities**

## **An Examination of Kentucky's Red Cross Shelters**

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**UNIVERSITY OF KENTUCKY MARTIN SCHOOL OF PUBLIC POLICY AND ADMINISTRATION**

**APRIL 18, 2013**

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## Executive Summary

Emergency management consists of four phases—mitigation, preparedness, response, and recovery. Sheltering is an aspect of the response phase. Response involves activities from many different organizations—local, volunteer, state, and federal. The initial response to a disaster is from local emergency management organizations. The American Red Cross, as chartered by the federal government, is primarily responsible for providing initial shelter and food to the affected population during a disaster.

Planning shelter capacity for individuals with disabilities has been historically problematic. It continues to be an issue as claims of inaccessible shelters occur with each new major disaster. Shelters can be accessible or inaccessible to individuals with disabilities, depending on the type and severity of disability. Access to emergency shelters and services is a right to all individuals in the community, including individuals with disabilities.

In Kentucky, 16.8 percent of all non-institutionalized people are individuals with disabilities.<sup>1</sup> Predicting disability data for each county presented an unexpected complication early in the project. Approximately half of the county-level disability data was obtained from the Census and the other half was determined through a regression analysis of data from the Census, and data from SSI blind and disabled and OASDI disabled workers beneficiaries.

Each of Kentucky's 120 counties is at risk for a variety of natural and human-made disasters. Noted risks for this study are earthquakes affecting the New Madrid seismic zone and tornadoes.

Capacity levels for each county were determined by analyzing capacity information from shelter listings in the American Red Cross National Shelter System. Using a capacity benchmark of 14.7 percent, capacities were examined statewide, and by dividing the counties into areas of analysis. The areas of analysis include rural and urban; New Madrid seismic zone and counties not located in the New Madrid seismic zone; and counties with high tornado risk and counties with lower tornado risk.

In terms of accessible shelter capacity related to the number of individuals with disabilities, urban counties are better prepared than rural counties. Counties not in the New Madrid seismic zone are better prepared to shelter individuals with disabilities than those counties that would be most affected by a major earthquake along the fault line. Counties at lower risk for tornadoes are better prepared than counties at high risk for tornado as related to accessible shelter capacity. Adequate shelter capacity for the total population and for individuals with disabilities must be part of disaster response plans across Kentucky.

The limitations of this study were related to the quality of the data available. Thirty-three counties were excluded from analysis due to the lack of shelter listings or capacity information for shelters listed. It is likely that there are shelters in those counties, but one cannot make that determination from the data available. Additionally, over half of the shelter listings were classified as “unknown” for accessibility.

Quality planning for disaster response requires reliable information. Kentucky's American Red Cross chapters need to work on updating shelter records to accurately reflect shelter capacities. Inclusion of individuals with disabilities in the planning process is also recommended. Further studies should be conducted to examine additional risk areas, and to further analyze capacities in relation to demographic composition of counties. An in-depth study of preparedness and response plans as related to individuals with disabilities would be helpful for a specific county or city. Based on the available information, Kentucky is unprepared to shelter its total population and individuals with disabilities in American Red Cross shelters.

## Introduction

Emergency management is an essential function of local, state, and federal government. In Kentucky, the types of disasters that can occur are both natural—tornadoes, floods, earthquakes, ice/snow storms, wildfires, landslides—and human-made—industrial accidents, terrorist attacks, fires. Additionally, Kentucky has two military bases (Fort Campbell and Fort Knox), stores of depleted uranium in Paducah, and chemical weapons storage at the Bluegrass Army Depot in Richmond. Local and state emergency managers must adequately plan for all possible disasters.

Emergency management consists of four components—mitigation, preparedness, response, and recovery.<sup>2</sup> Numerous local, state, and federal agencies, as well as nonprofit and private organizations, engage in emergency management activities. This paper focuses on the response component, particularly in regards to sheltering.

Response involves activities from many different organizations—local, volunteer, state, and federal. The initial response to a disaster is from local emergency management organizations—fire, police, city/county emergency management, and other related organizations as described in local emergency plans. The local organization is also responsible for developing emergency plans and coordinating with other local, state, and regional agencies.<sup>3</sup> Voluntary organizations such as the American Red Cross and other organizations active during disaster respond in coordination with the efforts of the local government. The American Red Cross is primarily responsible for providing initial shelter and food. State emergency management organizations are called in to supplement the local response. The state organizations also develop statewide emergency plans and coordinate with agencies at all levels. State emergency management organizations also assess damage and recommend the governor's request for federal

disaster declaration.<sup>4</sup> The federal government becomes involved in disaster response when requested by the state. The governor must request a federal disaster declaration. FEMA is the federal agency that manages federal emergency management activities, and acts on behalf of the federal government to supplement the available resources of local, voluntary, and state organizations.<sup>5</sup>

In order to shelter evacuees during a disaster, a community must adequately prepare shelter spaces for that particular population. Individuals with disabilities should be included in general population shelter plans to ensure independence and inclusion. The American Red Cross and local communities need to identify what types of modifications must be made to a space depending on the types of disabilities present in the community. This requires being familiar with potential shelter spaces and being educated about the different types of disabilities and related modifications that may be needed in a shelter environment.

According to the Americans with Disabilities Act of 1990 (ADA), “the term ‘disability’ means, with respect to an individual, a physical or mental impairment that substantially limits one or more major life activities of such individual, a recording of such an impairment, or being regarded as having such an impairment.”<sup>6</sup> The ADA does not name all of the disabilities covered. The types of disabilities identified by the Census Bureau’s American Community Survey are hearing, vision, cognitive, ambulatory, self-care, and independent living.<sup>7</sup> The broader definition of disability from the Census Bureau is “a long-lasting physical, mental, or emotional condition” which “can make it difficult for a person to do activities such as walking, climbing stairs, dressing, bathing, learning, or remembering” and “can also impede a person from being able to go outside the home alone or to work at a job or business.”<sup>8</sup>

Shelters can be accessible or inaccessible to individuals with disabilities, depending on the type and severity of disability. Accessible “refers to a site, facility, work environment, service, or program that is easy to approach, enter, operate, participate in, and/or use safely and with dignity by a person with a disability”.<sup>9</sup> A shelter can be accessible but not ADA compliant. The ADA contains technical requirements to be followed regarding aspects of the physical building, such as ramp slope and door width. Modifications can be made to shelters to make them accessible to individuals with disabilities. The modifications would vary depending on the type of disability (a way to communicate for the deaf, specialized cots, ramps, modified bathrooms, etc.). Additionally, costs of modifications must be examined to determine if they are reasonable. The only way communities can know what modifications might be needed is to identify who lives in those communities.<sup>10</sup>

### **Problem Statement**

Sheltering is a major function of the response component of emergency management. Access to emergency shelters and services is a right to all individuals in the community, including individuals with disabilities. In order to adequately plan shelter space, the American Red Cross must work in coordination with local and state entities to examine the demographic composition of communities and disaster response plans to ensure that all people are included, including in regards to accessible shelters. An estimated 16.8 percent of all non-institutionalized people in Kentucky are individuals with disabilities.<sup>11</sup>

In 2011, FEMA initiated a national dialogue on a Whole Community approach to emergency management, which includes planning for all demographics and engaging all parts of the community in planning for disasters.<sup>12</sup> The Americans with Disabilities Act (ADA) of 1990 requires making emergency preparedness and response programs accessible to individuals with



disabilities.<sup>13</sup> Additionally, the Rehabilitation Act, Executive Order 13347, and other laws and legal rulings mandate inclusivity for individuals with disabilities in general population shelters. During the response following Hurricane Katrina, many individuals with disabilities were separated from personal care assistants and family members, forced to leave behind medical equipment and mobility aids, and stripped of their independence—with some even ending up institutionalized states away.<sup>14</sup> Individuals with disabilities were also turned away from general population shelters and sent to special needs or medical shelters. Without adequate and accessible shelters, the community failed to prepare for disaster. In the case of Hurricane Katrina in New Orleans, an adequate supply of accessible shelters combined with a better evacuation system would have enabled more individuals with disabilities to maintain independence and stay with family members or caregivers.

In a disaster, individuals with disabilities face unique challenges in evacuation and accessible shelter. An adequate supply of accessible shelters is a concern for individuals with disabilities, and should also be of personal concern for individuals without disabilities, as anyone can become temporarily or permanently disabled following surgery, illness, or injury. Ensuring adequate and legally compliant shelter for individuals with disabilities is essential in preparing for disasters. It is a civil right that cannot be overlooked, and the Kentucky emergency management community must provide adequate emergency shelter.

## **Literature Review**

### *Disaster Response*

Disaster declarations are becoming more frequent and damages more devastating. Some researchers attribute the increase in number and in magnitude to urban sprawl especially in areas at high risk for natural disasters, climate change, and structural mitigation works that are not

properly funded or maintained.<sup>15</sup> This paper focuses on sheltering, a critical aspect of the response phase. Temporary shelters are intended to provide for the immediate needs of individuals during a disaster situation. These needs include housing, feeding, basic first aid and medical screening, and to aid in creating a system of disaster welfare information.<sup>16</sup> Shelters can be either mass care shelters or special needs or medical shelters, which are intended for people who need specialized medical care found in a nursing home or hospital.<sup>17</sup>

### *Disability Preparedness*

Administrative failure at all levels of government during Hurricane Katrina in response to the needs of individuals with disabilities forced the emergency management community to examine policies and practices related to disability preparedness.<sup>18</sup> Seventy-three percent of Katrina deaths in New Orleans were among those 60 and older, yet they were only 15 percent of the population.<sup>19</sup> The failure of local organizations to properly manage evacuation and shelter contributed to the death of Benilda Caixeta, a quadriplegic residing in the upper Ninth Ward who unsuccessfully tried for three days to evacuate.<sup>20</sup> She contacted the local paratransit system, 911, and even reached out to contacts in her disability advocacy network.<sup>21</sup> Benilda was found five days later in her apartment floating next to her wheelchair.<sup>22</sup> Many of those individuals with disabilities who were able to reach shelters were turned away due to their disabilities, oftentimes referred to special needs shelters and separated from caregivers and family members,<sup>23</sup> or sent to other shelter locations without durable medical equipment, like wheelchairs,<sup>24</sup> that had previously enabled them to function independently. “The ability of persons with disabilities to function independently requires extending each community’s existing social and civic fabric, usually in the form of accommodations or modifications to the way in which services are delivered to the larger community.”<sup>25</sup> After Hurricane Katrina, government and organizational

leaders vowed change, yet the same issues regarding shelter and individuals with disabilities occurred during the hurricane season two years later.<sup>26</sup>

Disaster plans must be as inclusive as the disasters themselves.<sup>27</sup> Emergency managers must plan for all members of the community;<sup>28</sup> this belief is espoused by FEMA in its Whole Community approach. Whole Community is a concept in which emergency management professionals, community leaders, residents, and government officials can discuss the needs of the entire community and assess what will work best.<sup>29</sup> Additionally, FEMA has prepared a document entitled “Guidance on Planning for Integration of Functional Needs Support Services in General Population Shelters” that provides in-depth information on the needs of individuals with disabilities in a shelter environment.<sup>30</sup>

#### *Americans with Disabilities Act (ADA) and Other Legislation*

The Americans with Disabilities Act (ADA) of 1990 protects individuals with disabilities from discrimination. Title II of the ADA provides protection from discrimination by a public entity, which is “defined as state and local governments, any department or other instrumentality of a state or local government, and certain transportation authorities”. The Department of Justice states: “Under Title II of the Americans with Disabilities Act (ADA), emergency programs, services, activities, and facilities must be accessible to people with disabilities and generally may not use eligibility criteria that screen out or tend to screen out people with disabilities.”<sup>31</sup>

Individuals with disabilities should typically be housed in mass care shelters, though specialized shelters (for the deaf, for example) can be offered but may not be required under the ADA.<sup>32</sup>

Disability Rights Advocates cited Title II of the ADA in its representation of plaintiffs in a suit filed in 2007 against the City of Oakland, California for its failure to consider individuals with disabilities in its emergency preparedness plans. The City of Oakland began working with

Disability Rights Advocates to include individuals with disabilities in plans, and the suit was settled in 2010.<sup>33</sup>

While Title II of the ADA applies to public entities, Title III applies to places of public accommodation. Places of public accommodation include hotels, restaurants, private schools, and professional offices, among others.<sup>34</sup> Title III of the ADA applies if a local or state government uses a place of public accommodation as a shelter during a disaster. Churches are not included as places of public accommodation, but if a public entity operates a shelter in a church facility, the public entity is responsible for Title II compliance. The majority of American Red Cross evacuation shelters in Kentucky are in schools and churches.

In 2011, a more recent suit was filed in U.S. District Court in New York. The suit was brought by the Brooklyn Center for Independence of the Disabled, Center for Independence of the Disabled-New York, and Tania Morales against Michael Bloomberg in his capacity as Mayor and the City of New York. The plaintiffs, represented by Disability Rights Advocates, alleged discrimination against individuals with disabilities in city emergency plans and violation of the ADA and Rehabilitation Act. The failure to plan in this particular case was related to response during Hurricane Irene in 2011. There were critical issues related to shelters. Tania Morales, an individual with disabilities, rode in her motorized wheelchair from her high-rise apartment to a nearby emergency shelter that was listed as accessible yet the gate for the ramp was locked and shelter staff could not locate a key. Only 26 percent of the shelters opened were listed as somewhat or completely accessible, not including those that had locked accessible entrances.<sup>35</sup> The suit alleges that, by failing to plan for individuals with disabilities in emergency plans, the Mayor and City of New York denied individuals with disabilities meaningful access to emergency preparedness programs and thus discriminated against them.<sup>36</sup> A class was granted

and a federal trial was underway as of mid-March 2013.<sup>37</sup>

As cited in the NYC case, the Rehabilitation Act applies to disaster response and shelter plans. Section 504 of the Rehabilitation Act of 1973 “protects qualified individuals from discrimination based on their disability”.<sup>38</sup> As related to disaster response and shelters, Section 504 prohibits recipients of federal financial assistance from denying individuals with disabilities the opportunity to participate in or benefit from federal funded programs or services.

Additionally, recipients of federal funds cannot, on the basis of disability, “deny access to programs, services, benefits, or opportunities to participate as a result of physical barriers”.<sup>39</sup>

Disasters are unique events that affect individuals as well as organizations. During disasters, organizations must quickly and effectively interact with other organizations, often sacrificing autonomy, in an environment in which the boundaries between the public and private sectors are blurred.<sup>40</sup> At the same time, these organizations are experiencing the effects of the disaster while they must adjust their usual mode of operation and apply different performance measures.<sup>41</sup> As interpreted by the Department of Justice, state and local governments are required to protect residents and visitors from harm.<sup>42</sup> While disasters are sudden and cause great loss in a number of ways, governments and third parties providing emergency and disaster-related services are still required to make disaster preparedness and response accessible to individuals with disabilities to prevent discrimination and ensure their civil rights to inclusion.<sup>43</sup>

Additional legislation governing disaster response in regards to individuals with disabilities includes Executive Order 13347 and the Post-Katrina Emergency Management Reform Act of 2006. President Bush signed Executive Order 13347, “Individuals with Disabilities in Emergency Preparedness,” in 2004. It states that the federal government must “appropriately support the safety and security of individuals with disabilities in situations

involving disasters”, and it established the Interagency Coordinating Council on Emergency Preparedness and Individuals with Disabilities (ICC) within the Department of Homeland Security.<sup>44</sup> The Post-Katrina Emergency Management Reform Act of 2006 created the position of disability coordinator in FEMA, which reports directly to the Administrator of FEMA.<sup>45</sup>

### *Collaboration*

Cross-sector collaboration involves partnerships between government, businesses, nonprofit organizations, and communities,<sup>46</sup> and is a way for entities to work together to increase capacity to manage the needs of the community after a disaster. A review of an emergency plan from any community would demonstrate a multitude of organizations from every sector that work together to respond to a disaster. For example, a review of the Lexington Fayette Emergency Operations Plan yields involvement from over thirty governmental departments, divisions, or agencies; a specialized unit from the National Guard, several nonprofit organizations, numerous private entities (ranging from churches to contractors), public and private schools, universities, and several volunteer organizations active in disasters.<sup>47</sup> Waugh asserts that “the involvement of nongovernmental actors builds the capacity of communities to deal with future disasters.”<sup>48</sup> In emergency management, collaboration is not only expected,<sup>49</sup> but also required for success.

### *American Red Cross*

A major actor in disaster response is the American Red Cross. The American Red Cross, as chartered by the Congress of the United States over one hundred years ago, bears the responsibility among others to “carry on a system of national and international relief in time of peace and apply the same in mitigating the sufferings caused by pestilence, famine, fire, floods, and other great national calamities, and to devise and carry on measures for preventing the

same.”<sup>50</sup> It is a federally chartered instrumentality of the United States but not a government agency, nor does it regularly receive federal funding. As a result of this collaboration, each year the American Red Cross provides shelter, food, and other services to victims of approximately 70,000 natural and human-made disasters in the United States.<sup>51</sup> These disasters range from fires, hurricanes, floods, earthquakes and tornadoes to hazardous materials spills, transportation accidents, and explosions.<sup>52</sup> By focusing on the immediate needs of people after a disaster, the American Red Cross serves an important function in disaster response.

### **Noted Risks in Kentucky**

Due to the constraints of this project, I will only examine risks related to earthquakes and tornadoes in Kentucky. Additional risks for Kentucky include flooding, severe winter storms, sink holes/karst, landslides, wildfire, chemical and industrial accidents, and terrorism. Future studies could include analysis using these additional risks.

#### *New Madrid Seismic Zone Risk*

The most seismically active region in the United States east of the Rocky Mountains, the New Madrid seismic zone comprises several faults that run from Illinois to Arkansas along the Mississippi River.<sup>53</sup> In Kentucky, the New Madrid seismic zone runs through the westernmost part of the state. The next major earthquake in the New Madrid seismic zone will affect a much larger population than the large earthquakes of the 1800s, and it will be more difficult to restore water, gas, electricity, and communications.<sup>54</sup>

Researchers from the Mid-America Earthquake Center conducted a study of estimated damages from a projected 7.7 magnitude earthquake at 2 a.m. along the entirety of the New Madrid seismic zone. According to their estimates, the earthquake would cause approximately 5,000 minor injuries, about 1,500 injuries requiring hospitalization, and an estimated 300

fatalities in Kentucky alone.<sup>55</sup> The largest number of casualties, roughly 2,750, would occur in McCracken County, and all casualties would be caused by building and infrastructure damage.<sup>56</sup>

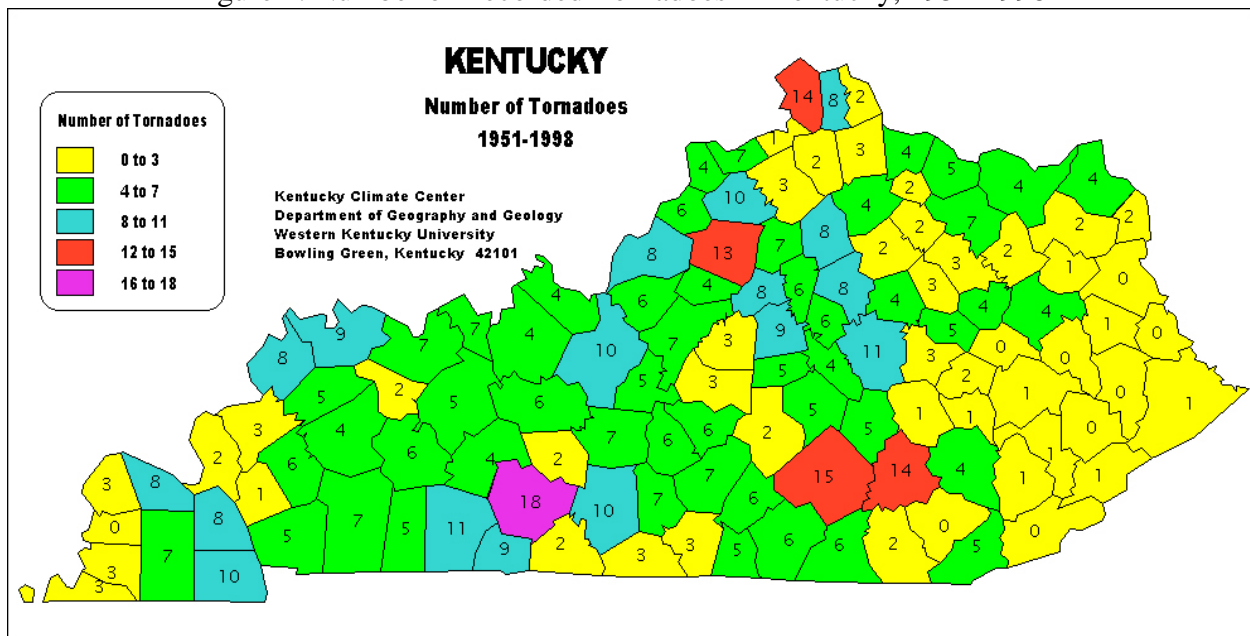
### *Tornado Risk*

A tornado can strike anywhere in Kentucky at any time. Kentucky has experienced tornadoes in every month of the calendar year.<sup>57</sup> Since 2000, 100 of Kentucky's 120 counties have been affected by tornadoes.<sup>58</sup> Approximately 65 counties in Kentucky are at high risk for a tornado. Counties were identified through the indication of tornadoes as one of the highest risks for the Area Development District in the hazard mitigation planning documents for that particular district. The Area Development Districts with high tornado risk are Barren River (10 counties), Cumberland Valley (8), Green River (7), Kentucky River (8), KIPDA (7), Lake Cumberland (10), Lincoln Trail (8), Pennyrile (9), and Purchase Area (8).

Figure 1. Kentucky Area Development Districts.<sup>59</sup>





Figure 2. Number of Recorded Tornadoes in Kentucky, 1951-1998<sup>60</sup>

Frequency and severity varies by district. Each county in the Barren River Area Development District has been struck at least once in the last fifty years.<sup>61</sup> Between 1950 and 2010, 153 tornadoes were recorded in the district.<sup>62</sup> The Green River Area Development District has experienced a high number of tornado events, with almost half occurring in the last decade.<sup>63</sup> The Kentucky River Area Development District experiences approximately four tornadoes every ten years.<sup>64</sup> KIPDA, excluding Louisville Metropolitan, experiences 1.1 tornado events per year. Louisville Metropolitan experiences one tornado event every 3.5 years.<sup>65</sup> The Lake Cumberland Area Development District experienced 87 tornadoes from 1950-2010, with each county in the district experiencing at least 5 events.<sup>66</sup> The Lincoln Trail Area Development District planning document indicated tornadoes as a high risk due to a high economic impact, although the chance of frequency is low (11 percent to 30 percent each year). Additionally, the district experienced a series of tornados on April 3, 1974, which killed 36 and injured 353.<sup>67</sup> The Pennyryle Area Development District has experienced 88 tornado events in the past fifty years.<sup>68</sup>

Though the FIVCO Area Development District did not indicate tornadoes as a high risk

and rarely experiences tornadoes, a tornado caused \$2,350,000 worth of damage in Lawrence County in March 2012.<sup>69</sup> Additionally, the Gateway Area Development District indicated tornadoes as a low risk yet a tornado devastated the town of West Liberty (Morgan County) in March 2012, causing significant damage and several fatalities. All of Kentucky's counties are susceptible to tornado strikes and subsequent damage.

### **Research Design**

Emergency managers must plan for disasters and include all members of the community. Ensuring adequate emergency shelter space is a critical component of an emergency operations plan. This includes planning for the general population and for individuals with disabilities. During a disaster, communities are required to offer appropriate protection to citizens, and individuals with disabilities require spaces that are minimally accessible and, ideally, ADA compliant.

This research will attempt to identify deficiencies in shelter capacity for the total population and for individuals with disabilities at the county level in Kentucky. Counties will also be divided into rural and urban. In addition to examining disability capacity, the counties will be divided into counties within and outside of the New Madrid seismic zone. This will determine whether the counties more likely to suffer substantial damage in the event of a major earthquake are more or less prepared as compared to other Kentucky counties in regards to disaster shelter. The counties will also be divided into those counties indicating a high risk of tornadoes as compared to those not indicating tornadoes as a high risk in Area Development District hazard mitigation plans.

This research seeks to answer the following questions:

- What is the capacity of counties in Kentucky to house their population in an American Red Cross (ARC) managed emergency shelter during a disaster?
- What is the capacity of counties in Kentucky to house individuals with disabilities in an ARC managed handicap accessible shelter?
- Comparing rural counties to urban counties, which area has a superior capacity to shelter its general population?
- Comparing rural counties to urban counties, which area has a superior capacity to shelter its individuals with disabilities?
- Comparing counties located in the New Madrid seismic zone to counties not located in the New Madrid seismic zone, which area has a superior capacity to shelter its general population?
- Comparing counties located in the New Madrid seismic zone to counties not in the New Madrid seismic zone, which area has a superior capacity to shelter its individuals with disabilities?
- Comparing counties with a high risk of tornadoes to counties with a lower risk, which area has a superior capacity to shelter its general population?
- Comparing counties with a high risk of tornadoes to counties with a lower risk, which area has a superior capacity to shelter its individuals with disabilities?

The unit of analysis is the county. Ratio analysis will be utilized in this project. In each county, a ratio of the potential number of people to utilize disaster shelter (total and disabled) to the number of shelter spaces in each category (total and accessible) will be used to determine preparedness in regards to shelter. Shelter capacity will also be examined statewide.

Shelter use rates vary based on a number of factors, including, but not limited to, type of disaster, time of day, and age, ethnicity, and socioeconomic status of evacuees. Based on earlier research, age and socioeconomic status of evacuees as well as characteristics of the particular disaster significantly affect shelter use rates.<sup>70</sup> Older and poor individuals are more likely to seek utilize shelter. Approximately 14.7 percent of the population of an affected county will seek shelter.<sup>71</sup> This benchmark will be utilized to determine sufficient capacity.

There are no county level disability data for all Kentucky counties. County-level disability data for 57 counties comes from Table S1810 Disability Characteristics from the 2009-2011 American Community Survey 3-Year Estimates produced by the U.S. Census Bureau.<sup>72</sup> The American Community Survey data includes only 57 of Kentucky's 120 counties. Using known values from the Census and data from OASDI Beneficiaries by State and County, 2011,<sup>73</sup> and from SSI Recipients by State and County, 2011<sup>74</sup> compiled by the Social Security Administration, disability numbers for the remaining 63 counties are estimated.

Table 1. Data Sources for Predicting Disability Population

2009-2011 American Community Survey 3-Year Estimates (US Census Bureau)	Total civilian non-institutionalized population	State, 57 counties
	With a disability	
	Percent with a disability	
SSI Recipients by State and County, 2011 (Social Security Administration)	Total SSI recipients	State, 120 counties
	SSI recipients blind and disabled	
OASDI Beneficiaries by State and County, 2011 (Social Security Admin)	Total OASDI beneficiaries	State, 120 counties
	OASDI beneficiaries disabled workers	
Calculated using Microsoft Excel	Percent of population receiving blind and disabled SSI benefits	State, 57 counties
	Percent of disability population receiving SSI benefits	
	Percent of population receiving OASDI disability benefits	
	Percent of disability population receiving OASDI disability benefits	

The 63 missing values for disability population were generated through regression analyses using STATA. The intent was to predict the missing value of “With disability” to determine the disability population for each of the 63 counties, not to interpret the data for causation. There were 58 observations in STATA (the state and 57 counties), and five regression analyses were conducted to predict fitted values and to generate missing data for the remaining 63 counties. The R-squared value is the percentage of variance in the dependent variable that is explained by the predictor variables. The R-squared values for the regression analyses listed in the chart below range from explaining about 50 percent to nearly 100 percent of the variance in the dependent variables. The independent variables were not as good at explaining the variance in “Percent of disability population receiving OASDI disability benefit” (R-squared 0.4958) as they were in predicting “With disability” (0.9999). The values of “With disability” were used to predict the missing values for disability population for the remaining 63 counties.

Table 2. Regression Results for Disability Data (standard error)

<i>Independent variables</i>	<i>Dependent variables</i>				
	With disability	Percent with a disability	Percent of disability population receiving SSI benefits	Percent of disability population receiving blind and disabled SSI benefits	Percent of disability population receiving OASDI disability benefit
Total civilian non-institutionalized population (1000000)	50500 (12200)	2.3 (28.2)	-76.6 (49.0)	-65.8 (47.6)	-62.1 (51.7)
Total SSI recipients	-2.44 (3.26)	0.002 (0.008)	0.026 (0.013)	0.014 (0.013)	0.008 (0.014)
SSI recipients blind and disabled	3.31 (3.67)	-0.001 (0.009)	-0.029 (0.015)	-0.016 (0.014)	-0.011 (0.016)

Percent of population receiving blind and disabled SSI benefits	-207.41 (189.35)	-0.434 (0.439)	5.651 (0.762)	5.401 (0.740)	0.721 (0.804)
Total OASDI beneficiaries (1000)	0.29 (0.11)	0.069 (0.247)	0.279 (0.429)	0.306 (0.417)	0.257 (4.529)
OASDI beneficiaries disabled workers (1000)	0.49 (0.64)	-1.704 (1.492)	1.912 (2.592)	1.437 (2.518)	2.295 (2.736)
Percent of population receiving OASDI disability benefits	386.76 (213.98)	2.710 (0.496)	-3.329 (0.861)	-3.126 (0.837)	0.905 (0.909)
constant	-1208.11* (552.00)	5.397 (1.279)	17.690 (2.221)	16.287 (2.158)	21.466 (2.344)
R-squared	0.9999	0.8392	0.9179	0.9185	0.4958
Adj R-squared	0.9999	0.8167	0.9064	0.9071	0.4252
No. observations	58	58	58	58	58

The American Red Cross National Shelter System (NSS) provides shelter data. In order to help manage the shelter function of the American Red Cross disaster response activities, Red Cross created the National Shelter System (NSS). The NSS is a database of over 56,000 shelter sites throughout the country. American Red Cross chapter staffs collect information about each shelter site using the Shelter Facility Survey form and enter it into the database. Information in the NSS is used during a disaster to identify sites and manage population, and also in planning by the American Red Cross, FEMA, and state and local emergency management.<sup>75</sup>

As of February 13, 2013, there were 988 shelter listings for Kentucky in the NSS and these listings include location, capacity, accessibility, and other information. Shelter listings that do not contain information regarding capacity were excluded from analysis. The Shelter Facility

Survey contains fields for basic shelter information, shelter capacity, pet shelter, facility construction and safety, sanitation, feeding, utilities, and accessibility. Shelter location, evacuation capacity, and accessibility are the areas of focus for this study. Evacuation shelter is intended to be short-term (three days or less). Evacuation capacity is determined by taking the total square footage of the shelter and dividing by 20 square feet per person to get the total person capacity.<sup>76</sup> There is also post-impact shelter, which is intended to be longer than three days. Post-impact capacity is calculated at 40 square feet per person. For Kentucky's 988 shelter listings, 145 are listed as post-impact shelters, 226 are evacuation shelters, and 463 are both post-impact and evacuation shelters. For the purposes of this study, I will examine only shelters classified as evacuation or both and with capacity information listed (689 shelters). In order to assess accessibility of a shelter space, the yes/no responses to the summary accessibility questions are used.

Table 3. Accessibility Summary Questions from  
American Red Cross Shelter Facility Survey

	<b>Accessible</b>	<b>Not Accessible</b>
<b>Question</b>	<b>Response</b>	
Relevant areas of the facility are accessible to people with disabilities	Yes	No
Facility has at least one accessible entrance and one accessible restroom, and is otherwise capable of being made accessible during a disaster with minor adjustments	Yes	No
Facility would require extensive adjustments to be accessible during a disaster	No	Yes

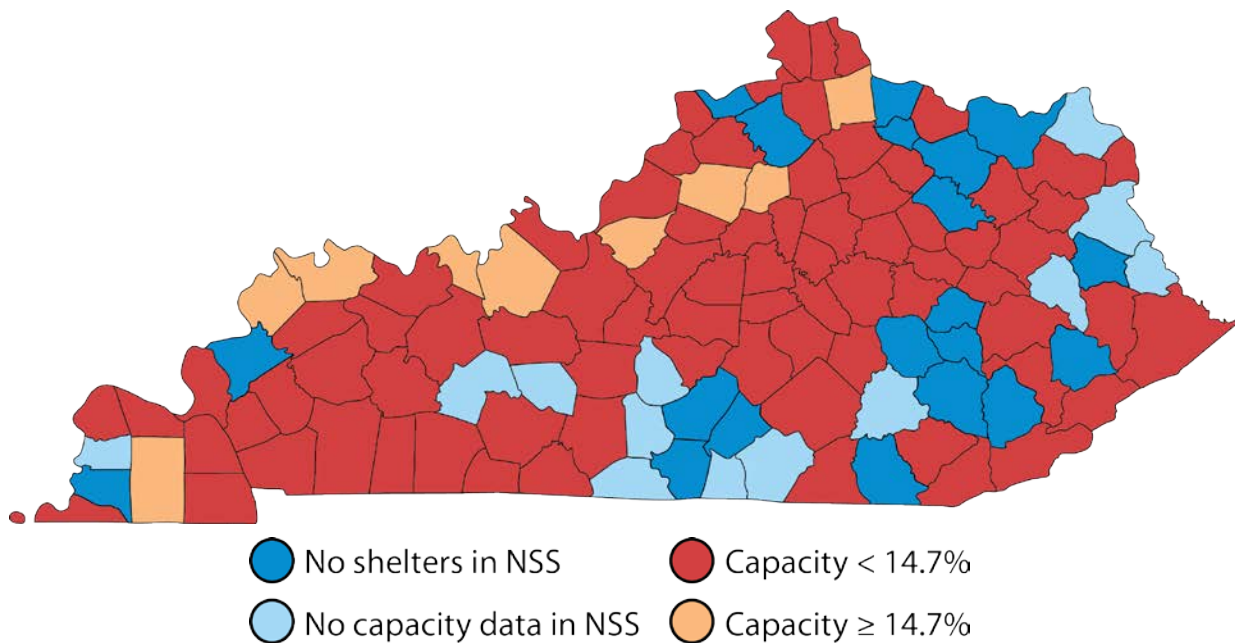
## Results and Discussion

### *Statewide Capacity*

#### *Total Population*

Of the 120 counties, I excluded 20 because there were no shelter entries in the American Red Cross National Shelter System. I excluded another 13 counties due to missing capacity information for all shelters listed for those counties. Statewide, the total evacuation capacity is for approximately 208,000 people. The average evacuation capacity for the county is 2,398 people, an average of 6.6 percent of the county's population. There were nine counties at or above the capacity benchmark of 14.7 percent (Breckinridge, Bullitt, Franklin, Graves, Hancock, Henderson, Pendleton, Shelby, and Union).

Figure 3. Statewide Capacity – Total Population



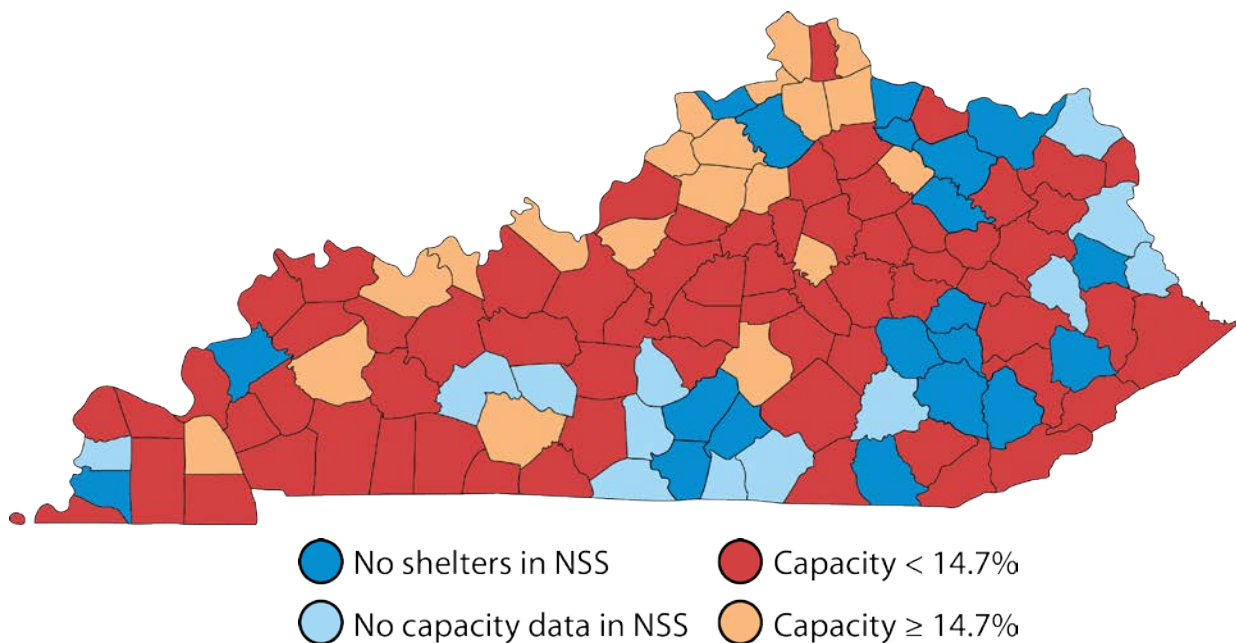
#### *Individuals with Disabilities*

Statewide, accessible capacity is for about 81,400 people. Shelter capacity indicated as “not accessible” is for roughly 2,600 people. Capacity that is “unknown” (lacking any indication



of accessibility) is for approximately 124,500 people. The average accessible evacuation capacity for the county is 936 people, an average of 15.8 percent of the counties' individuals with disabilities. There were twenty counties at or above the capacity benchmark for individuals with disabilities (Boone, Bullitt, Campbell, Casey, Daviess, Franklin, Gallatin, Grant, Hancock, Henry, Hopkins, Jessamine, Marshall, Meade, Nicholas, Oldham, Pendleton, Shelby, Trimble, Warren).

Figure 4. Statewide Capacity – Individuals with Disabilities



#### *Rural and Urban Counties*

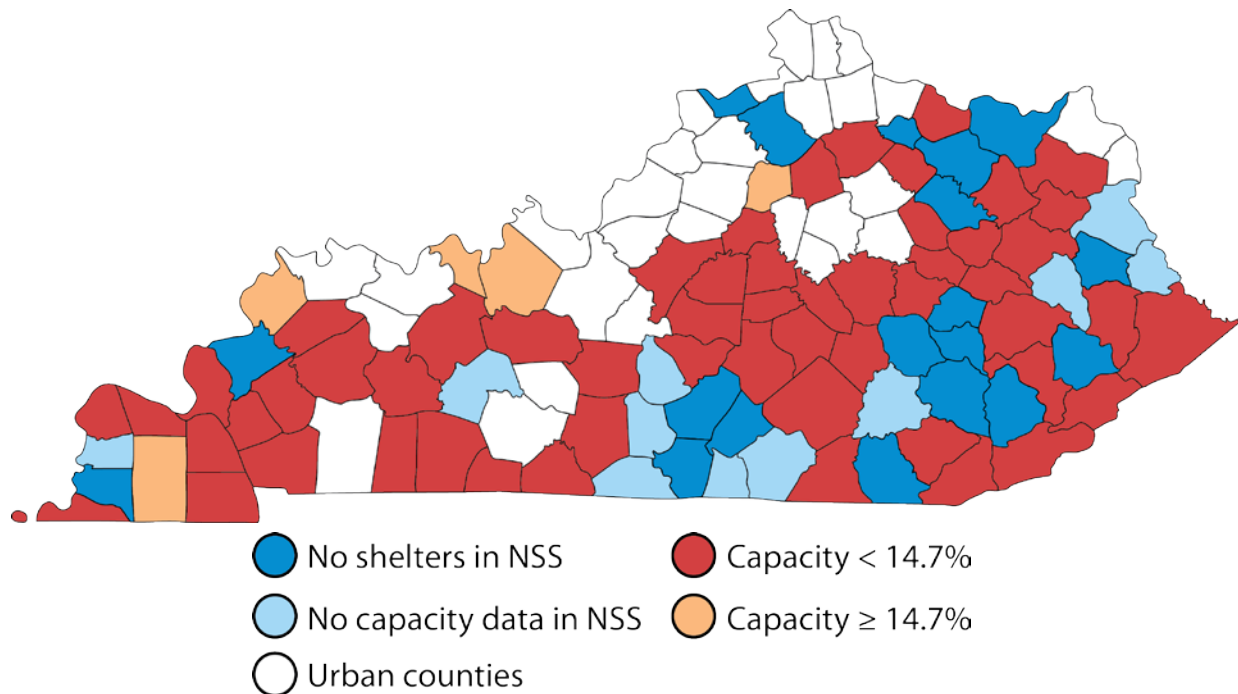
Designation of rural or urban for each county was determined by using a list of rural counties from the Office of Rural Health Policy.<sup>77</sup> The Office of Rural Health Policy utilized 2003 Rural-Urban Continuum Codes and census tract data to determine rural and urban status. In instances where Rural-Urban Continuum Codes indicated “metropolitan” but all census tracts in the county were rural, the county was deemed rural. An update to the Codes is planned in July 2013.

Thirty of Kentucky's 120 counties are urban and 90 counties are classified as rural. There are differences between Kentucky's rural and urban population. The per-capita income is lower for rural counties while poverty rates are higher.<sup>78</sup> Educational attainment is also lower in rural counties.<sup>79</sup> It is important to note that the population of individuals with disabilities is almost evenly divided between the rural and urban counties.

### *Total Population*

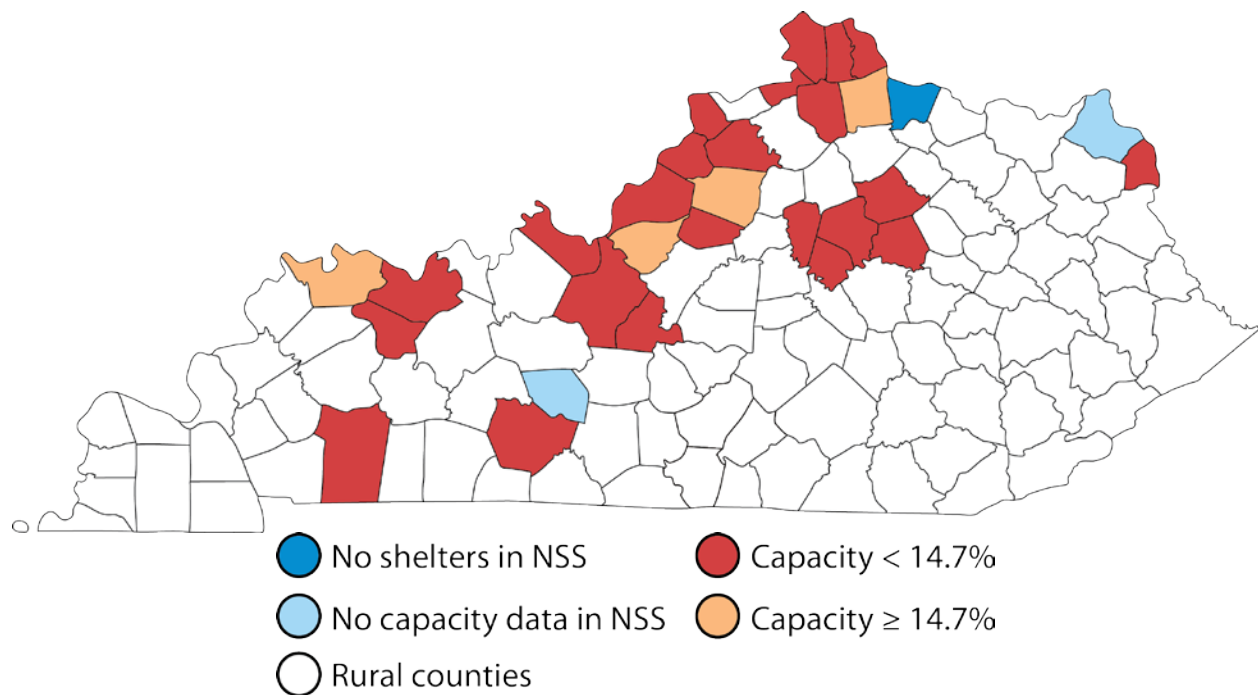
Of the 90 rural counties, I excluded 19 due to lack of shelters listed in the National Shelter System and an additional 11 due to missing capacity information. The 60 remaining rural counties can house 5.3 percent of the total population. The average rural county can house 5.8 percent of the total population in a Red Cross evacuation shelter. Five rural counties were at or above the capacity benchmark for the total population (Breckinridge, Franklin, Graves, Hancock, Union).

Figure 5. Rural Capacity – Total Population



Of the 30 urban counties, I excluded one county because it did not have shelter listings in the National Shelter System. Two additional counties were excluded for missing capacity information. As a group, the 27 remaining urban counties can shelter 5.7 percent of the total population. On average, an urban county can shelter 8.4 percent of the total population. Four urban counties were at or above the 14.7 percent capacity benchmark for total population (Bullitt, Henderson, Pendleton, Shelby).

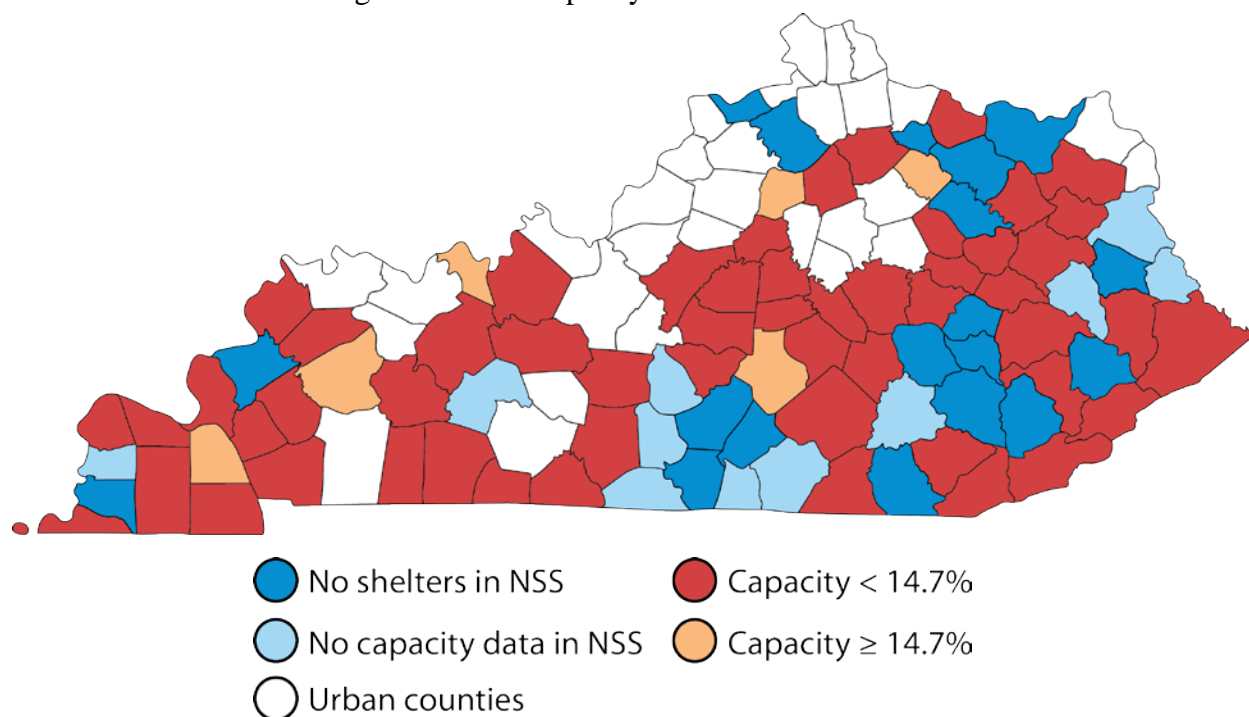
Figure 6. Urban Capacity – Total Population



### *Individuals with Disabilities*

There are 60 rural counties included in this study. For all rural counties, the total accessible shelters can house 7.2 percent of individuals with disabilities in those counties. The average rural county can shelter 7.7 percent of individuals with disabilities. Six rural counties are at or above the capacity benchmark of 14.7 percent for individuals with disabilities (Casey, Franklin, Hancock, Hopkins, Marshall, Nicholas).

Figure 7. Rural Capacity – Individuals with Disabilities

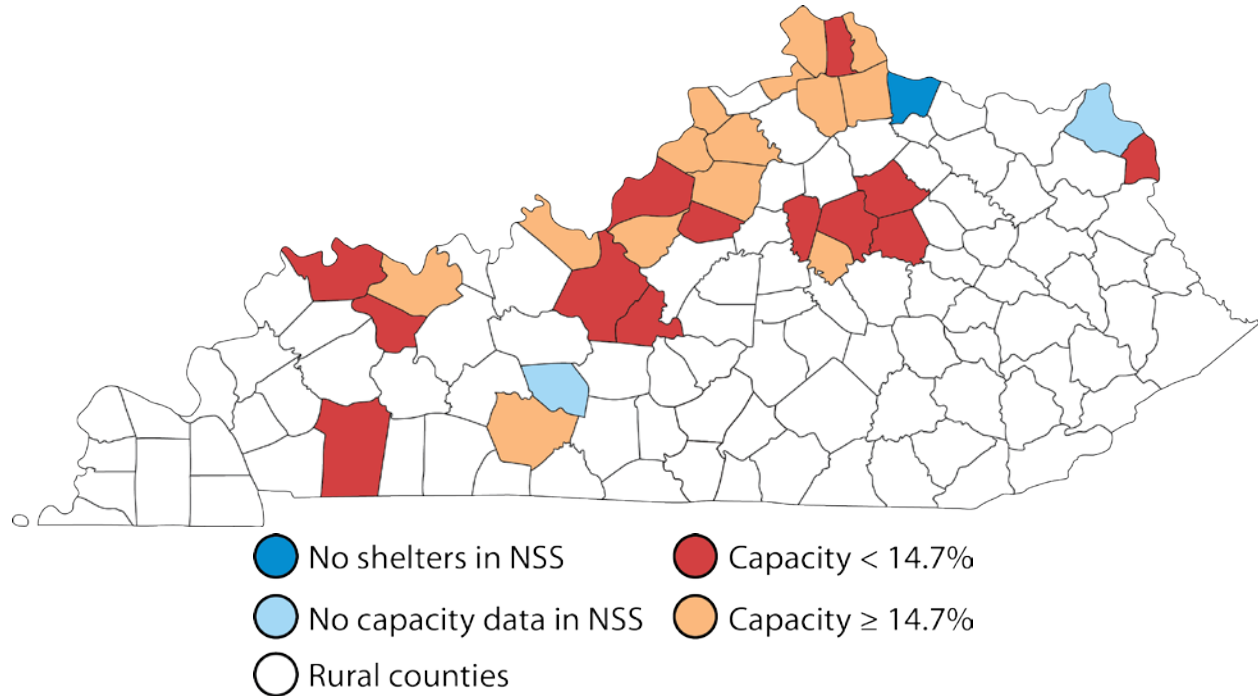


For the 27 urban counties included in this study, the total accessible shelters can house 19.3 percent of individuals with disabilities. The average urban county can shelter 33.9 percent of individuals with disabilities. In the urban counties, 14 were at or above the capacity benchmark of 14.7 for individuals with disabilities (Boone, Bullitt, Campbell, Daviess, Gallatin, Grant, Henry, Jessamine, Meade, Oldham, Pendleton, Shelby, Trimble, Warren). It is important to note that the difference between the averages of rural counties and urban counties is statistically significant with a p-value of 0.01 at 0.05 confidence level. Also, the population of individuals with disabilities is almost evenly split between the rural and urban counties of the state.

On average, urban counties were better prepared for the total population (though still not at the benchmark) and for individuals with disabilities (exceeding benchmark at 33.9 percent) as compared to rural counties. The same is true for the capacities of the whole area of analysis. As a

whole, urban counties were slightly better prepared for the total population (5.7 percent capacity) and much more prepared for individuals with disabilities (19.3 percent capacity) than were rural counties (5.3 percent and 7.2 percent respectively).

Figure 8. Urban Capacity – Individuals with Disabilities



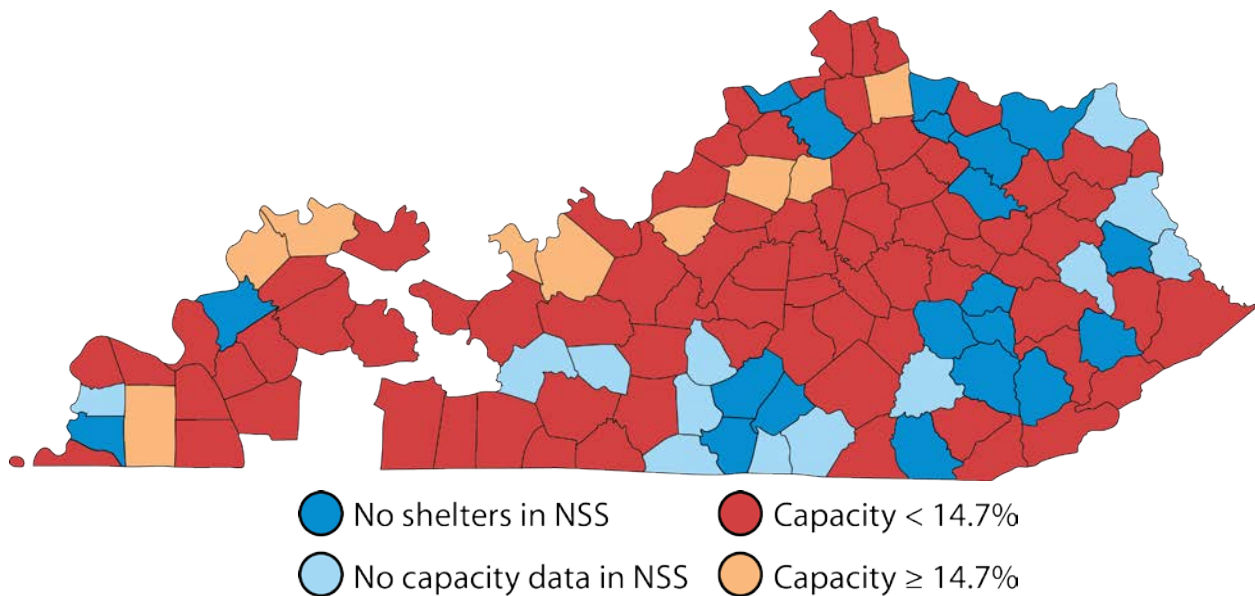
### *New Madrid Seismic Zone Capacity*

#### *Total Population*

Of 19 counties at high risk for earthquakes (located in the New Madrid seismic zone), I excluded two counties because they did not have shelters listed in the National Shelter System. There was an additional exclusion of one county for missing capacity information for all shelters listed for that particular county. For all counties in the New Madrid seismic zone, shelter capacity is at 10.9 percent of total population. The average New Madrid seismic zone county can shelter 10.2 percent of its total population. There are three New Madrid seismic zone counties at or above the capacity benchmark of 14.7 percent (Graves, Henderson, Union).

There are 101 total non-NMSZ counties; 18 were excluded due to not having shelter entries in NSS. An additional 12 counties were excluded due to missing capacity information for all shelters entered for those counties. For all counties not in the New Madrid seismic zone, shelter capacity is at 4.7 percent of total population. The average non-NMSZ county can shelter 5.8 percent of its total population. There were six non-NMSZ counties at or above the capacity benchmark for sheltering the general population (Breckinridge, Bullitt, Franklin, Hancock, Pendleton, Shelby).

Figure 9. NMSZ v Non-NMSZ Capacity – Total Population



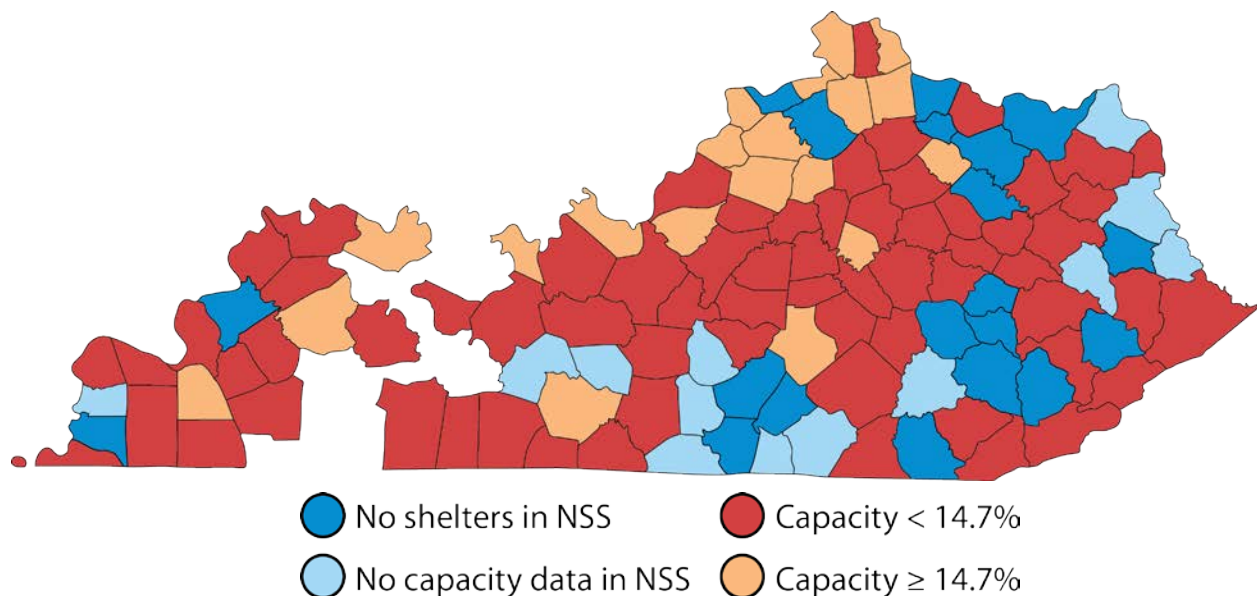
#### *Individuals with Disabilities*

There are 16 New Madrid seismic zone counties included in this study. For all counties in the New Madrid seismic zone, the total accessible shelters can house 6.7 percent of individuals with disabilities. The average county can shelter 5 percent of individuals with disabilities. Three New Madrid seismic zone counties are at or above the capacity benchmark of 14.7 percent for individuals with disabilities (Davies, Hopkins, Marshall).



For the 71 non-NMSZ counties, the total capacity is 14.6 percent of individuals with disabilities. The average county capacity is 18.3 percent for individuals with disabilities. Seventeen non-NMSZ counties are at or above the capacity benchmark for sheltering individuals with disabilities, and it is important to note that five of those counties are at or above 100% capacity for individuals with disabilities. The difference between the average capacities for individuals with disabilities in New Madrid seismic zone counties and non-NMSZ counties is statistically significant with a p-value of 0.01 at 0.05 confidence level.

Figure 10. NMSZ v Non-NMSZ Capacity – Individuals with Disabilities



On average, New Madrid seismic zone counties were better prepared for the total population (though still not at the benchmark), but less prepared for the disability population as compared to counties not in the New Madrid seismic zone. As a whole, the counties in the New Madrid seismic zone were better prepared for the total population (10.9 percent capacity) but less prepared for individuals with disabilities (6.7 percent capacity) than were counties not located within the New Madrid seismic zone (4.7 percent and 14.6 percent respectively).

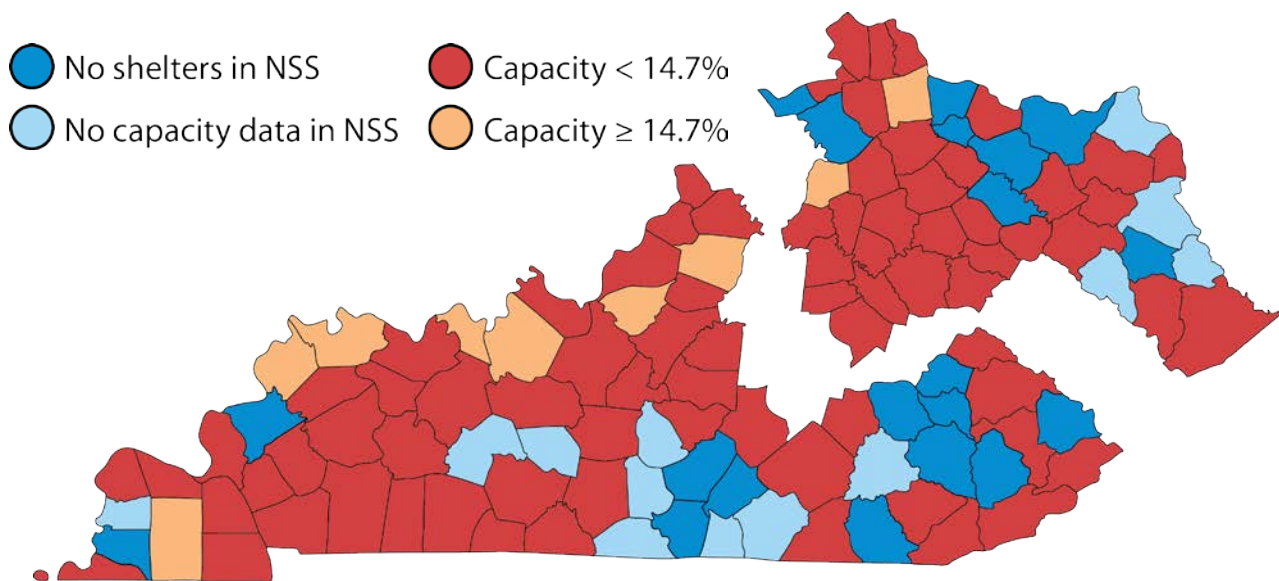
## *Tornado Capacity*

### *Total Population*

Seventy-five counties indicated tornadoes as high risks in Area Development District hazard mitigation plans. Of those 75 counties, I excluded 12 due to missing shelters in NSS and an additional nine counties for missing capacity information for each shelter listed in NSS. The total capacity of the 54 counties with high tornado risk for the total population is 6.3 percent. The average county capacity for total population is 7.1 percent. Seven counties are at or above the capacity benchmark of 14.7 percent.

Forty-five counties did not indicate tornadoes as a high risk. Of those 45 counties, I excluded eight due to not having shelter entries in NSS and an additional four were excluded for missing capacity information for every shelter listed in the NSS. The total capacity of all 33 counties at lower risk for tornadoes for total population is 4.3 percent. On average, counties at lower risk for tornadoes could shelter 5.8 percent of total population. Two counties are at or above the capacity benchmark for total population.

Figure 11. Tornado v. Non-Tornado Capacity – Total Population



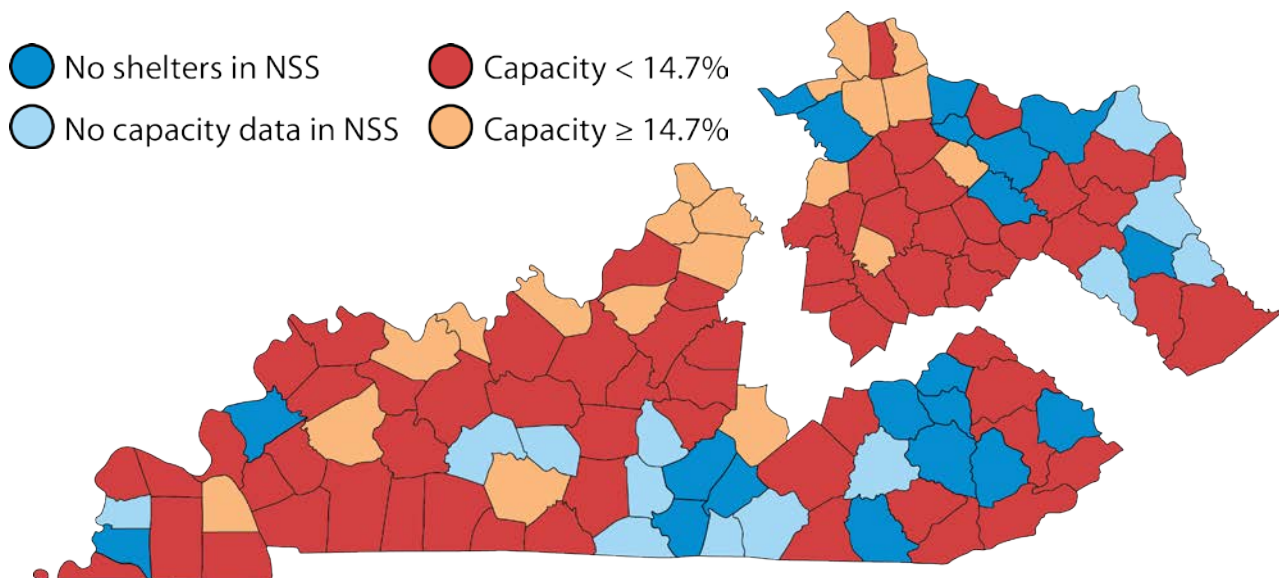


### *Individuals with Disabilities*

The accessible capacity for the 54 counties indicated as having a high risk of tornadoes for individuals with disabilities is 10.7 percent. On average, 12.6 percent of the disability population of a county could be sheltered in an accessible shelter. Twelve counties are at or above the capacity benchmark of 14.7 percent.

The thirty-three counties that did not indicate tornadoes as a high risk can shelter 18.4 percent of individuals with disabilities living in those counties. On average, a county at lower risk for tornadoes can house 21.2 percent of individuals with disabilities. Eight counties are at or above the capacity benchmark of 14.7 percent, and three of which are near or above 100 percent capacity for individuals with disabilities.

Figure 12. Tornado v Non-Tornado Capacity – Individuals with Disabilities



On average, counties at high risk for tornadoes were slightly better prepared (still not at the 14.7 percent benchmark) to shelter the total population, but less prepared to shelter the disability population. As a whole, the counties indicating high tornado risk were better prepared for the total population (6.3 percent can be sheltered) but less prepared for individuals with

disabilities (10.7 percent in accessible shelters) than were counties not indicating high tornado risk (4.3 percent and 18.4 percent respectively).

### **Conclusions and Recommendations**

Counties in Kentucky have varying levels of capacities to shelter total population and individuals with disabilities during a disaster. In order to adequately prepare for disasters of all kinds, Kentucky emergency management organizations need to work with American Red Cross chapters to properly identify and classify shelters in each county. Higher shelter capacities mean more choices of shelter sites when disasters occur. Statewide, the average county can shelter 6.6 percent of its total population. Only nine counties are at or above the capacity benchmark of 14.7 percent. Statewide capacity is better for individuals with disabilities. On average, a county can shelter 15.8 percent of individuals with disabilities in accessible shelters, and 20 counties are at or above the capacity benchmark. Urban counties are better prepared than rural counties to shelter total population and individuals with disabilities. On average, counties in the New Madrid seismic zone are better prepared to shelter total population but less prepared to shelter individuals with disabilities in accessible shelters, as compared to counties not located in the New Madrid seismic zone. Counties indicating high tornado risk are better prepared to shelter the total population but less prepared to shelter individuals with disabilities in accessible shelters, as compared to counties that did not indicate tornadoes as a high risk.

Based on these observations, the following actions are recommended. Kentucky emergency management organizations need to work with the American Red Cross to identify and properly classify potential disaster shelters in each of the 120 counties. Due to a lack of shelter listings or capacity information for shelters listed, I excluded 33 of Kentucky's 120 counties. Increasing total capacity and selecting sites that are accessible or can be easily

modified during disaster would increase capacity levels for the total population and for individuals with disabilities.

American Red Cross chapters in Kentucky need to prioritize updating Shelter Facility Surveys so that accurate information is available when the next disaster occurs. Accurate information will allow for better planning and shelter operation, and will likely increase the speed of information transmitted to the public about shelter options. Shelter listings older than three years or missing information regarding capacity or accessibility need to be reviewed and updated in the National Shelter System.

Individuals with mobility, vision, and hearing disabilities and disability advocacy groups need to be included in selecting and reviewing potential shelters. Planning *with* a person with disabilities is different than planning *for* a person with disabilities. A person with a disability can tour a space and quickly identify potential issues to access. Consideration must also be given to evacuation procedures and how individuals with disabilities will reach accessible shelters within a community. Kentucky disability advocacy groups and individuals with disabilities should meet with emergency management organizations to examine the feasibility of a voluntary registry to identify individuals with disabilities who will require additional assistance during a disaster. Collaboration among different groups is important in preparing for the whole community.

### **Limitations and Alternatives**

The limitations of this study are related to the quality and availability of data.

A major problem is the lack of data on individuals with disabilities at the county level for all 120 counties. While the regression of the data from the American Community Survey and SSI and OASDI produced reliable predicted values, it would be better to use actual reported numbers for each of the counties. Additionally, the use of different data sources to predict disability

population is problematic as the criteria for disability qualification differ by source. A related issue is the matter of self-reporting disability on the American Community Survey. Ideally, disability data would be separated by type of disability (hearing, vision, mobility). Then shelter modifications could be examined based on the composition of the disability population of each county rather than broadly assuming mobility disability as indicated in most of the literature on shelters and in the American Red Cross Shelter Facility Survey.

The data from the American Red Cross National Shelter System varies for each shelter listing. Some shelter listings were complete with all questions answered, and others were merely name and location of shelter. Twenty of Kentucky's counties did not have a single shelter entry. Thirteen additional counties were excluded because of missing capacity information for every shelter listed in those counties. Of Kentucky's 120 counties, only 87 were included in this study. Future studies would need to find a way to identify shelters and capacities in those counties, or determine why there are not shelters. Of the 988 shelters listed for Kentucky, only 689 were included in this study. Post-impact shelter exclusions accounted for 145 exclusions, and another 154 were excluded due to missing capacity information. Many of those missing capacity information were also missing classification (evacuation or post-impact). Most of these listings were limited to name and location with no additional information. Updated capacity information is required to accurately assess the ability of Kentucky's counties to provide adequate disaster shelter. Additionally, over half of the shelter capacity for Kentucky was listed as "unknown" for accessibility. Defining these shelters as accessible or inaccessible would change the results of future studies. Another problem with the NSS data was the age of the entries. As reported by the Bluegrass chapter of the American Red Cross, "some entries are one year old, others are ten years old".<sup>80</sup> The goal for that particular chapter is to have 25% of the shelter records updated by

June 30, 2013. Goals to update shelter records for other Kentucky chapters are not known.

An additional limitation is the lack of a standardized capacity benchmark. A previous study analyzing shelter capacity for Pennsylvania cited capacity benchmarks used by cities in other state with no explanation as to why those cities chose those benchmarks.<sup>81</sup> When I asked the Bluegrass chapter of the American Red Cross what capacity benchmark they used when planning shelters, a range from 10 to 30 percent was given; documentation to support these numbers was not available when requested.<sup>82</sup> Without a widely recognized and accepted benchmark, emergency management organizations plan using different criteria and may underestimate shelter need.

Future studies of disaster preparedness for individuals with disabilities in Kentucky should first address the significant data issues related to the number of individuals with disabilities in each county and the incompleteness of the American Red Cross National Shelter System entries. Additionally, future studies should include post-impact shelter capacity and should attempt to divide the state into other zones of analysis. Counties could be divided based on average age and socioeconomic status of residents as this has shown to affect shelter use rates. Other risks, such as historical flooding, would also be meaningful for Kentucky. An alternative study could be conducted to examine the overall disaster preparedness of a county or city's population of individuals with disabilities. This would include examining shelter capacities, geographic distribution of shelters, evacuation procedures and transportation availability, a survey of personal preparedness, and inclusion in and creation of disaster response plans.

## Appendix

Table 4. Rural-Urban Continuum Codes<sup>83</sup>

2003 Rural-Urban Continuum Codes	
Code	Description
Metro counties:	
1	Counties in metro areas of 1 million population or more
2	Counties in metro areas of 250,000 to 1 million population
3	Counties in metro areas of fewer than 250,000 population
Nonmetro counties:	
4	Urban population of 20,000 or more, adjacent to a metro area
5	Urban population of 20,000 or more, not adjacent to a metro area
6	Urban population of 2,500 to 19,999, adjacent to a metro area
7	Urban population of 2,500 to 19,999, not adjacent to a metro area
8	Completely rural or less than 2,500 urban population, adjacent to a metro area
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area

Table 5. Capacity Summary – Average County

Area of Analysis (number of counties)	Average County Capacity– Total Population	Average County Capacity– Individuals with Disabilities
State (87)	6.6	15.8
Rural (60)	5.8%	7.7%
Urban (27)	8.4%	33.9%
T-test		
t statistic	-1.18	-2.64
P value	0.24	0.01*
New Madrid seismic zone (16)	10.2%	5.0%
non-New Madrid seismic zone (71)	5.8%	18.3%
T-test		
t statistic	1.28	-2.53
P value	0.22	0.01*
Tornado (54)	7.1%	12.6%
non-Tornado (33)	5.8%	21.2%
T-test		
t statistic	0.68	-0.95
P value	0.50	0.35

Table 6. Capacity Summary – Whole Area

Area of Analysis (number of counties)	Capacity for Whole Area – Total Population (%)	Capacity for Whole Area – Individuals with Disabilities (%)
State (87)	5.5	13.6
Rural (60)	5.3	7.2
Urban (27)	5.7	19.3
New Madrid seismic zone (16)	10.9	6.7
non-New Madrid seismic zone (71)	4.7	14.6
Tornado (54)	6.3	10.7
non-Tornado (33)	4.3	18.4

Table 7. Counties excluded for no shelter listings in NSS (20)

Adair	Johnson
Bath	Knott
Bracken	Lee
Carroll	Leslie
Clay	Lewis
Crittenden	Owen
Cumberland	Owsley
Fleming	Robertson
Hickman	Russell
Jackson	Whitley

Table 8. Counties excluded due to missing capacity information for all shelters listed (13)

Butler	Lawrence
Carlisle	Magoffin
Clinton	Martin
Edmonson	Metcalf
Green	Monroe
Greenup	Wayne
Laurel	

Table 9. Counties at or above capacity benchmark for total population with capacities (9)

Breckinridge	27.3
Bullitt	17.6
Franklin	28.1
Graves	28.7
Hancock	38.1
Henderson	42.1
Pendleton	32.8
Shelby	18.5
Union	38.5

Table 10. Counties at or above capacity benchmark for individuals with disabilities with capacities (20)

Boone	71.1
Bullitt	93.7
Campbell	49.5
Casey	18.8
Daviess	15.3
Franklin	160.2
Gallatin	15.6
Grant	96.4
Hancock	145.4
Henry	15.5
Hopkins	14.9
Jessamine	27.7
Marshall	27
Meade	36.8
Nicholas	46.5
Oldham	110.8
Pendleton	194.4
Shelby	104.7
Trimble	29.6
Warren	16.9



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- <sup>1</sup> U.S. Census Bureau. “2009-2011 American Community Survey, Table S1810 Disability Characteristics, 3-Year Estimates, Counties in Kentucky,” 2012, Accessed January 2013, [http://factfinder2.census.gov/bkmk/table/1.0/en/ACS/11\\_3YR/S1810/0400000US21.05000](http://factfinder2.census.gov/bkmk/table/1.0/en/ACS/11_3YR/S1810/0400000US21.05000).
- <sup>2</sup> Rubin, 8.
- <sup>3</sup> FEMA, Emergency Management Institute, “G197 Emergency Planning and Special Needs Populations, Unit 2: The Emergency Management Process,” slide 10, Accessed February 2013, <http://www.training.fema.gov/EMIWeb/pub/downloads.asp>.
- <sup>4</sup> FEMA, EMI, “G197,” slide 12.
- <sup>5</sup> FEMA, EMI, “G197,” slide 13.
- <sup>6</sup> Department of Justice, “Americans with Disabilities Act of 1990, Section 3 – Definition of disability,” 2009, Accessed January 2013, <http://www.ada.gov/pubs/ada.htm>.
- <sup>7</sup> US Census Bureau, “American Community Survey (ACS) Disability Methodology,” 2012, Accessed January 2013, <http://www.census.gov/people/disability/methodology/acs.html>.
- <sup>8</sup> <https://ask.census.gov/faq.php?id=5000&faqId=6573>.
- <sup>9</sup> The District of Columbia Office of Disability Rights. “ADA 101 ADA Glossary- Legal and Practical Terms A-B,” Accessed March 2013, <http://odr.dc.gov/book/ada-101-ada-glossary-legal-and-practical-terms/ada-101-ada-glossary-legal-and-practical-terms-b>.
- <sup>10</sup> Patricia Seybold, Executive Director at Kentucky Developmental Disabilities Council, [Pat.Seybold@ky.gov](mailto:Pat.Seybold@ky.gov) “RE: UK Martin School- capstone project,” 14 March 2013, email.
- <sup>11</sup> U.S. Census Bureau. “2009-2011 American Community Survey, Table S1810 Disability Characteristics, 3-Year Estimates, Counties in Kentucky,” 2012, Accessed January 2013, [http://factfinder2.census.gov/bkmk/table/1.0/en/ACS/11\\_3YR/S1810/0400000US21.05000](http://factfinder2.census.gov/bkmk/table/1.0/en/ACS/11_3YR/S1810/0400000US21.05000).
- <sup>12</sup> FEMA, “Whole Community,” 2012, Accessed January 2013, <http://www.fema.gov/whole-community>.
- <sup>13</sup> Department of Justice, “Americans with Disabilities Act of 1990, Title II – Public Services,” 2009, Accessed January 2013, <http://www.ada.gov/pubs/ada.htm>.
- <sup>14</sup> “Emergency Management and People with Disabilities: Before, During and After,” Congressional Briefing, November 10, 2005, pp. 3, Accessed January 2013, [http://www.ncd.gov/rawmedia\\_repository/68e81a9c\\_757d\\_4c61\\_9dc4\\_b2493f947bda?document.pdf](http://www.ncd.gov/rawmedia_repository/68e81a9c_757d_4c61_9dc4_b2493f947bda?document.pdf).
- <sup>15</sup> Claire B. Rubin, ed., *Emergency Management: The American Experience, 1900-2010*, 2d ed. (Boca Raton, FL: CRC Press, 2012), 131-2.
- <sup>16</sup> Lexington Fayette Emergency Management, “EFS 6: Human Services, Mass Care, Housing, and Food Management,” 2013, pp. 10, Accessed February 2013, <http://www.lexingtonky.gov/Modules/ShowDocument.aspx?documentid=22852>.
- <sup>17</sup> Department of Justice, “Chapter 7: Emergency Management Under Title II of the ADA—Best Practices Tool Kit for State and Local Governments,” 2009, Accessed February 2013, <http://www.ada.gov/pcatoolkit/chap7emergencygmt.htm>.
- <sup>18</sup> American National Standards Institute Homeland Security Standards Panel, “Emergency Preparedness for People with Disabilities and Special Needs Final Workshop Report,” 2010, pp. 21.
- <sup>19</sup> M. J. Gibson, AARP Public Policy Institute, “We can do better: Lessons learned for protecting older persons in disasters,” 2006, pp. 19, Accessed February 2013, <http://assets.aarp.org/rgcenter/il/better.pdf>.

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- <sup>20</sup> Marcie Roth, Director, FEMA Office of Disability Integration and Coordination, “Testimony before the House Homeland Security Committee’s Subcommittee on Emergency Communications, Preparedness, and Response,” 2010, pp. 3-4, Accessed February 2013, [http://www.fema.gov/pdf/about/odic/oral\\_statement\\_roth.pdf](http://www.fema.gov/pdf/about/odic/oral_statement_roth.pdf).
- <sup>21</sup> Roth, 3-4.
- <sup>22</sup> Roth, 3-4.
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